# Chapter 4: Final Concepts & Plan Implementation

## Introduction

This chapter provides implementation strategies and also revised concepts based on feedback received from the community during public input meetings. The final concepts are provided to stem discussion for the creation of a potential overlay district or other ordinance revisions that will facilitate a swift and effective implementation process.

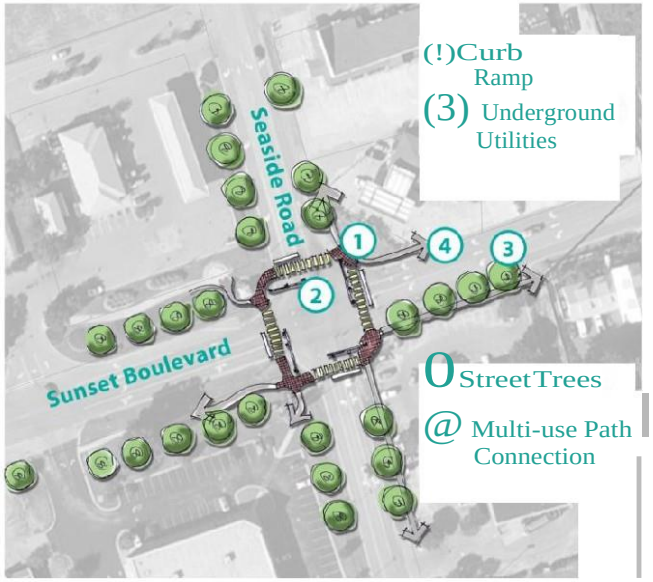
## Revised Concepts

The following conceptual designs have been drafted as a result of dialogue with town stakeholders, the community at-large, and input received during the public participation process. These concepts are in no means binding agreements of future capital improvements nor do they have a dedicated funding stream to help realize the vision presented. The concepts should be used as tool for the town to guide capital improvements in the study area for the next five, ten, or twenty years. In addition, components of the plan and conceptual ideas that relate to the private realm should be used in the creation of uniform design standards or the creation of an overlay district. No one concept can capture all the desires of a community, but it can attempt to include the most agreed upon aspects of the community thus far.

## Sunset Boulevard & Seaside Road

Potential improvements at this intersection include street trees, uniform lighting, underground utilities (mast arm signal pole), curb ramps, and striping to demarcate a bicycle/pedestrian crossing.

## Sunset Blvd & Seaside Rd




It is important to remember that an existing image (shown above) of this intersection scored the lowest out ofthe "Streets- Thru Zone" category in the Visual Preference Survey, signaling the need for improvements.

## Sunset Boulevard Corridor

One of the focus areas of the Vision Plan is the cross section of Sunset Boulevard. In particular, the areas zoned MB-2. Difficulties exist in developing land in this area due to the required parking, setbacks, and presence of a 20' utility easement. In addition, this stretch of the Sunset Boulevard corridor is the gateway to the island for visitors and residents alike. As a result, the community has a strong desire to see Sunset Boulevard developed in a uniform and aesthetically pleasing fashion. Efforts are under way to ensure this desire will become a realization. In fact, a recently developed parcel along the corridor houses a structure that was ranked the highest in the Visual Preference Survey (show below).

Further, language in the recently adopted Unified Development Ordinance states under "General Requirements for All Buildings" that "Adjacent building shall be compatible in regard to spacing, setbacks, proportions, materials, and scale." In keeping with desires of the ordinance, if no further standards for structures were adopted then constructed buildings should convey, in general, the same look and feel as the highest rated visual preference image (shown to the left}.

**Concept**


The concept above depicts a potential development along Sunset Boulevard (a larger copy is provided in the appendix). Suggested improvements within the 75' Sunset Boulevard right-of-way include a 10' multi-use path, street trees, and lighting (see the cross section provided on the next page).


Changes to the Unified Development Ordinance that would allow this potential development include reduced parking requirements, removal of the sidewalk requirement, and the inclusion of a plant material palette to be used for required landscaping.

One of the key outcomes of the vision plan process was the overwhelming need to provide a multi-use path that runs along the corridor (9,438 feet). In the concept above, the multi-use path is located within the Sunset Boulevard right-of-way. Please note, the proposed path may be located both within and outside of the right-of-way depending on alignment needs.

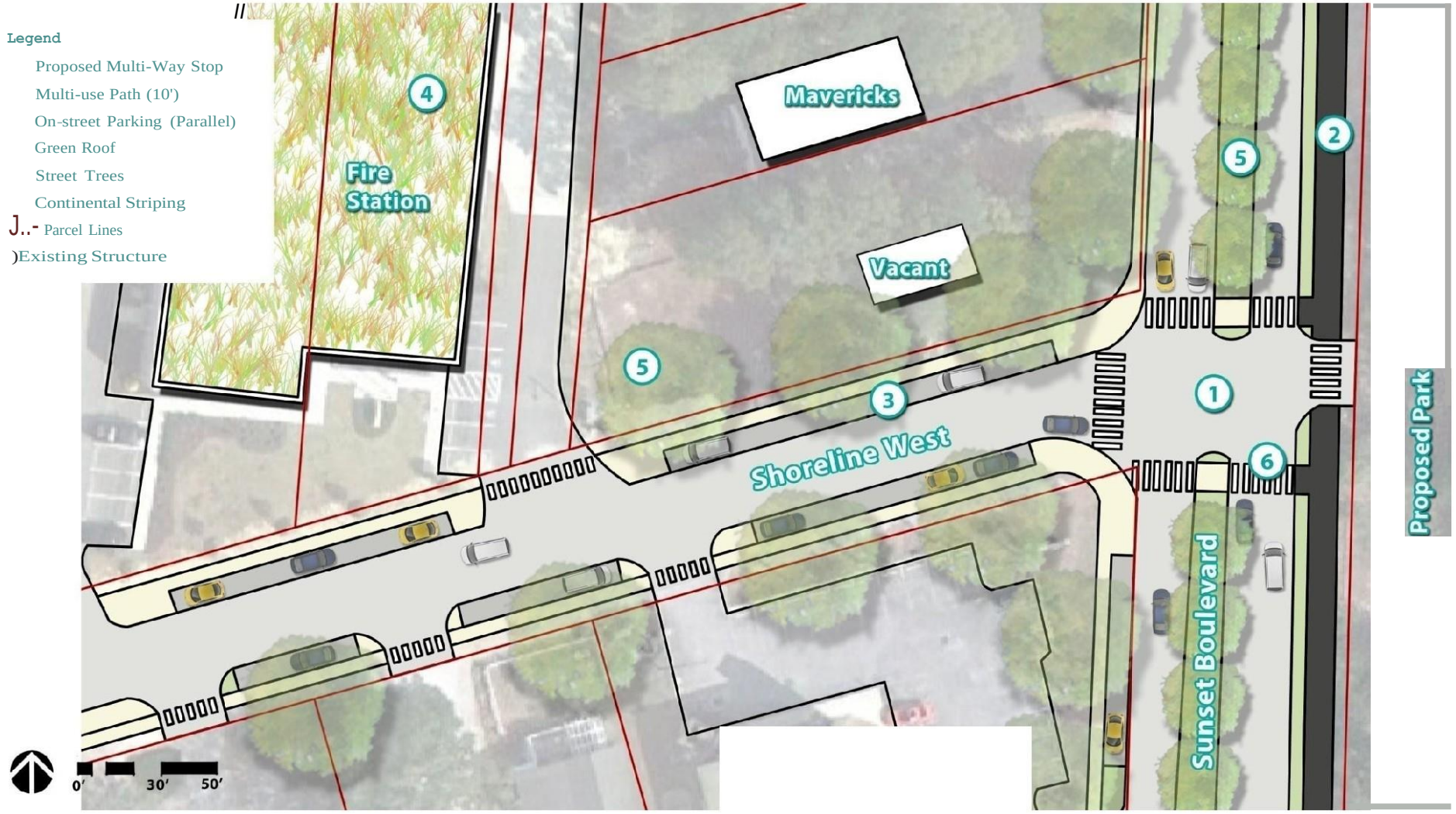
## Shoreline Drive West & Sunset Boulevard

The intersection of Shoreline Drive West and Sunset Boulevard was identified during the public participation process as an area in need of traffic calming and safety measures. At present, only vehicles heading east on Shoreline West are required to stop. In addition, no sidewalks or crosswalks are present to facilitate the safe flow of pedestrians.


Other considerations that need to be factored into any proposed changes to the intersection include the need to accommodate turning movements from ladder trucks leaving the fire station, the number of non-motorized trips that will be generated from the proposed park, and lastly the availability of on-street parking. Response from town officials and aerial photos show that vehicles currently choose to park within the right-of-way (on-street) on both Shoreline Drive West and Sunset Boulevard south of the intersection.


Another factor that contributes to the relative safety of any roadway or intersection is the speed limit. Currently, the speed on Sunset Boulevard and Shoreline Drive West is 45 miles per hour. Research has proven that pedestrians are much more likely to be fatally injured when struck by a vehicle travelling at speeds greater than 30 miles per hour. Based on this finding, it is suggested that the speed limit be reduced to 25 miles per hour south of the bridge intersection along Sunset Boulevard. In addition, it is suggested that for the first quarter mile of Shoreline Drive West (heading west) the speed limit be reduced to 25 miles per hour.

A concept is provided on the next page that depicts potential improvements that will serve to calm traffic, provide aesthetic appeal, and increase the availability of parking.




**Concept**

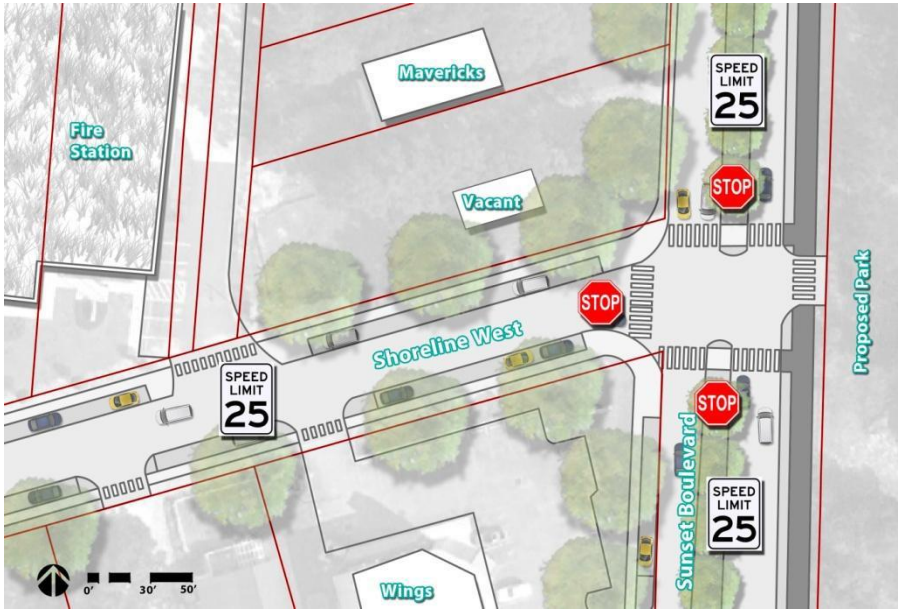
Ideas put forth in the concept above include a multi-use path, crosswalks, on-street parking, street trees, and a multi-way stop. Though on-street parking was viewed unfavorably by some community residents, it remains both a viable option to not only increase the availability of parking, but also to provide a traffic calming treatment. On-street parking also provides a buffer to the pedestrian from vehicular traffic. Inthe schematic above,it is estimated that approximately 22 on-street parallel parking spaces could be accommodated in the existing Shoreline Drive West right-of-way (60'). Four additional spaces could be provided adjacent to the Wings retail store on Sunset Boulevard. These spaces appear to be located on private property, however. Further, the possibility remains to reconfigure this

portion of Sunset Boulevard to remove the landscaped median and further increase on-street parking.

Street trees and a 10′ multi-use path are also proposed in this concept. Providing street trees was viewed favorably during all public participation meetings, as was the proposed multi-use path. The multi-use path would run along Sunset Boulevard from the intersection of Seaside Road all the way to the southern terminus of the proposed Sunset Beach Town Park.

Continental Striping, a longitudinal high-visibility crosswalk marking, is proposed as both a traffic calming measure and as a solution for increasing the safety of pedestrians.

The existing landscaped medians are also shown repurposed (see below) to function as a refuge island for crossing pedestrians or cyclists. As mentioned previously, it is suggested the speed limit be reduced to 25 mph and that stop signs be installed.




## Benefits of Street Trees

For a planting cost of $250-600 (includes first 3 years of maintenance), a single street tree returns over $90,000 of direct benefits (not including aesthetic, social, and natural) in the lifetime of the tree. Additional benefits include:

**1. Reduced and more appropriate urban traffic speeds.** Urban street trees create vertical walls framing streets, and a defined edge, helping motorists guide their movement and assess their speed (leading to overall speed reductions). Street safety comparisons show a reduction of run-off the-road crashes and overall crash severity when street tree sections are compared with equivalent treeless streets.

**2. Create safer walking environments**, by forming and framing visual walls and providing distinct edges to sidewalks so that motorists better distinguish between their environment and one shared with people. If a motorist were to significantly err in their urban driving task, street trees can deflect or fully stop a motorist from taking another human life.

**3. Increased security**. Trees create more pleasant walking environments, bringing about increased walking, talking, pride, care of place, association and therefore, actual ownership and surveillance of homes, blocks, neighborhoods plazas, businesses, and other civic spaces.

**4. Improved business.** Businesses on treescaped streets show 20% higher income streams, which is often the essential competitive edge needed for main street store success versus competition from plaza discount store prices.

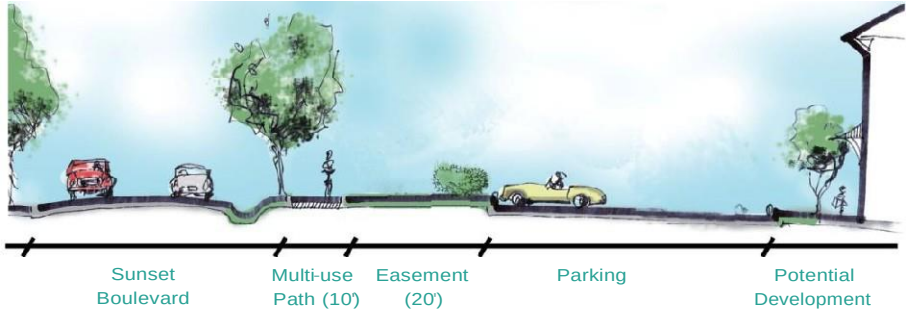
**5. Less drainage infrastructure.** Trees absorb the first 30% of most precipitation through their leaf system, allowing evaporation back into the atmosphere. This moisture never hits the ground. Another percentage (up to 30%) of precipitation is absorbed back into the ground and taken in and held onto by the root structure, then absorbed and transpired back to the air.

*(Source: 22 Benefits of Urban Street Trees by Dan Burden)*

## Waterfront District

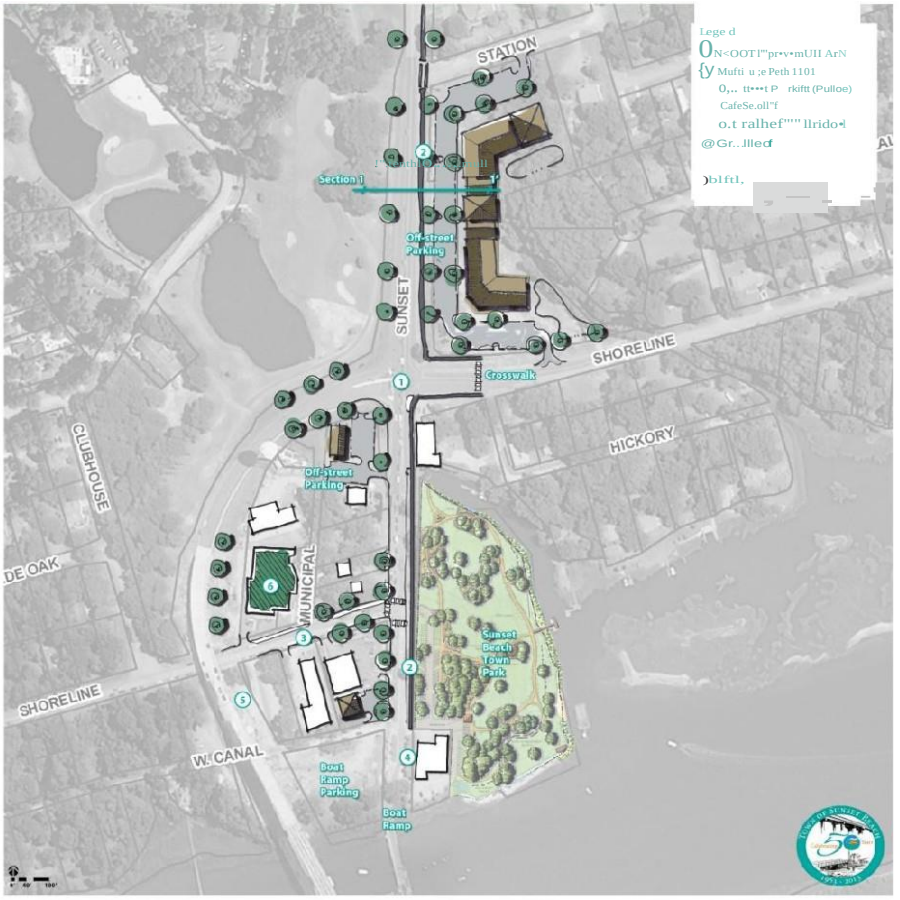
Based on the findings of the "Like, Dislike, and More Ideas" exercise, the initial concept for the Waterfront District was revised. As stated previously, the most vigorously supported component of that concept was the proposed 10' multi-use path. Other ideas receiving support in the Waterfront District concepts include the location of parking in the front of buildings and also street trees. Please note, full page copies of all concepts are provided in Appendix 1.

### Section 1




In order to facilitate the movement of non-motorized traffic at the intersection of Shoreline Drive East and Sunset Boulevard (commonly referred to as the "bridge intersection"), it is proposed that the multi-use path crossing be pulled to the east by approximately 200 feet. In addition, any proposed improvements to this intersection must also accommodate non-motorized traffic exiting the bridge.


### Sunset Beach Waterfront District: Revised Concept



## Plan Implementation

For Sunset Beach to realize the Vision set forth through this process, the town must revise certain regulatory requirements to facilitate the capital improvement process. The responsibility for some capital improvement recommendations fall fully on the town and must be prioritized over the next five, ten, or twenty years to come to fruition. Those include providing an enhanced streetscape and the pursuit of funds to construct a multi-use path. Once this plan is adopted, it can be utilized as a tool to pursue said funding.

Suggested policy recommendations include changes to the parking standards, landscape standards, and lighting requirements. The creation of an Overlay District is another vehicle by which regulatory standards may be revised to achieve some of the desires set forth in the Vision Plan.

Please note that these recommendations should be formalized through dialogue with the town's planning board prior to undergoing the text amendment process.

Lastly, the town should work through this process to allow for development to take place in certain areas that may be constrained due to lot size or depth.

**Parking Standards**

It is suggested that parking standards in the MB-2 zoning district be reduced to better accommodate future businesses. The construction of a multi-use path along these properties will provide an alternative means of travel to and from establishments in this zoning district. Percent reductions or changes in the requirements for square footage may be used as solutions.

Bicycle parking should also be included for certain areas and future uses along the Sunset Boulevard corridor.

**Landscape & Lighting Standards**

A plant and lighting pallet should be created that can be used in the creation of a uniform look and feel for the public realm in the study area.

Below is a list of trees with qualities that would provide aesthetic qualities that are championed by the town. In addition, many of these species are salt and drought tolerant.

| BOTANICAL NAME | COMMON NAME |
|---|---|
| *LARGER TREES AND SHADE TREES* | |
| MAGNOLIA GRANDIFLORA | SOUTHERN MAGNNOLIA |
| PINUS PALUSTRIS | LONG LEAF PINE |
| QUERCUS PHELLOS | WILLOWOAK |
| QUERCUS VIRGINIANA | LIVE OAK |
| TAXODIUM OISTICHUM | BALD CYPRESS |
| *UNDERSTORY TREES* | |
| CERCIS CANADENSIS | REDBUD |
| CORNUS FLORIDA | FLOWERING DOGWOOD |
| ILEX 'NELLIE STEVENS' | NELLIE STEVENS HOLLY |
| ILEXOPACA | AMERICAN HOLLY |
| LAGERSTROEMIA HYBRIDS | CRAPE MYRTLE HYBRIDS |
| MAGNOLIA SOULANGIANA | SAUCER MAGNOLIA |
| MAGNOLIA VIRGINIANA | SWEET BAY MAGNOLIA |

Below are images of several species provided on the list in the previous page.

Live Oak & Redbud

Southern Magnolia & Longleaf Pine

Bald Cypress & Saucer Magnolia

Crape Myrtle & Willow Oak

Below are samples of Brunswick Electric's outdoor lighting products.

## Implementation Strategy

The following implementation actions are listed by short and long-term strategies. Additional cost estimates for capital improvements can be found in Appendix 4. Each implementation action is given an approximate timeline, responsible party, and estimated cost. It is anticipated that an outside consultant may be necessary to accomplish several strategies. Consultants from varying disciplines may be considered including those with expertise in landscape architecture, engineering, or urban design.

**Short Term Actions: 1 – 5 years**

| Description | Responsible Party | Estimated Timeline | Estimated Cost | Priority |
|---|---|---|---|---|
| Ordinance revisions drafted to establish either an overlay district or regulatory standards that reflect the findings of the vision plan. Uniform lighting and landscape standards included as part of ordinance revisions. Based on the community's preference for landscape material the potential for enhanced tree preservation standards should be explored. | Planning Board; Town Council. | 1 year | No Cost Anticipated | High |
| Parking study conducted for Waterfront District to determine approximate number of spaces needed to accommodate average seasonal traffic. | Planning Board; Town Council; Consultant. | 1-3 years | $5,500 | Low |
| The town should pursue NCDOT Bicycle & Pedestrian grant funding to complete a Comprehensive Bicycle and Pedestrian Plan. The NCDOT grant requires a 20% local match. | Planning Board; Town Council; Consultant. | 1-3 years | Local Match (if funded): $7,000 | High |
| Decorative fence (6' privacy) installed below ICWW flyover bridge. The town should consult a licensed and bonded fencing contractor prior to installation.<br>• 2,000 feet of estimated ornamental/decorative fencing. | NDOT; Town Council. | 1-2 years | $40,000 | High |
| Sunset Boulevard 10' asphalt multi-use path design and construction (approximately 9,438 feet in length). This will include landscape and lighting.<br>• Town must conduct site specific alignment for multi-use path<br>• Town may wish to seek funding through NCDOT or alternative sources (see section on "Funding Sources")<br>• Landscape material and lighting must be selected for installation along the multi-use path<br>• Town may wish to complete the project in two or three phases | NCDOT; Town Council; Consultant. | 1-4 years | Multi-use Path: $471,900<br>Landscape Material: $212,355<br>Lighting (118 lights SQaced at 80 feet): $177,000 | High |
| Speed limit reduction on Sunset Boulevard (south of bridge intersection) and Shoreline Drive West. | NCDOT; Planning Board; Town Council. | 1-2 years | No Cost Anticipated | Medium |
| Multi-way stop installation at the intersection of Shoreline Drive West and Sunset Boulevard. | NCDOT; Town Council. | 1-2 years | No Cost Anticipated | Medium |

| Description | Responsible Party | Estimated Timeline | Estimated Cost | Priority |
|---|---|---|---|---|
| Continental striping installed and pedestrian refuge island added at the intersection of Shoreline Drive West and Sunset Boulevard.<br>• Fluorescent thermoplastic markings added on all legs of intersection, including proposed multi-use path and town park crossing<br>• Medians on Sunset Boulevard repurposed to allow for pedestrian refuge | NCDOT; Town Council. | 1-3 years | Crosswalk Markings: $4,500<br>Refuge Island (existing median retrofit): $10,000 | Medium |

**Long Term Actions: 5-10 years**

| Description | Responsible Party | Estimated Timeline | Estimated Cost | Priority |
|---|---|---|---|---|
| Branding strategy and signage for Waterfront District and/or Sunset Boulevard. Town should work with a graphic design consultant to develop signage and branding for the Waterfront District. | Planning Board; Town Council; Consultant. | 5-7 years | $3,500 | Low |
| Pedestrian crossing with signal, curb ramps, and continental striping installed at the intersection of Seaside Road (NC 904) and Sunset Boulevard (NC 179).<br>• Pedestrian crossing signals<br>• Curb ramps<br>• Crosswalk markings | NCDOT; Town Council. | 5-7 years | Pedestrian Signals: $30,000<br>Curb Ramps: $2,000<br>Crosswalk Markings: $4,500 | Medium |
| Installation of street trees along Sunset Boulevard.<br>• Study to determine approximate need and location of street trees- town should consult with a certified arborist and/or licensed landscape architect.<br>• Size and species of tree will need to be determined based on community input.<br>• Water needs and soil test will need to take place prior to installation. | NCDOT; Planning Board; Town Council; Consultant. | 7- 10 years | Study: $26,500<br>Street Tree Installation: $330,330 | High |

- Only certain areas of Sunset Boulevard will need street tree installation.

| Description | Responsible Party | Estimated Timeline | Estimated Cost | Priority |
|---|---|---|---|---|
| Shoreline Drive West streetscape design and construction to include sidewalks, street trees, and on-street parking.<br>• The town should consult with a licensed landscape architect and/or professional engineer to create construction documents.<br>• Figures are provided for an estimated 470 feet of Shoreline West retrofit. | NCDOT; Planning Board; Town Council; Consultant. | 7-10 years | Construction Documents: $52,640<br>Streetsca(;!e Construction: $658,000 | Medium |
| Mast arm signal pole installed at the intersection of Seaside Road and Sunset Boulevard. | NCDOT; Town Council. | 7-10 years | $32,000 | Medium |
| Street trees and signage installed along Seaside Road as gateway treatment or entrance improvements to Town of Sunset Beach.<br>• The town should consult with a licensed landscape architect and/or professional engineer to create construction documents.<br>• Figures are provided for an estimated 1,900 feet of Seaside Road (NC 904) retrofit. | NCDOT; Town Council; Consultant. | 7-10 years | Signaqe: $1,200<br>Construction Documents: $212,800<br>Streetsca(;!e Construction: $2,660,000 | High |
| Vegetated roof (green roof) installed atop the Fire Station. | Town Council; Consultant. | 7-10 years | $471,250 | Low |

## Funding Sources

### North Carolina- Recreational Trails Program

The RTP is a federal grant program authorized by Congress in 2012 as Moving Ahead for Progress in the 21 Century (MAP-21). The intent of the RTP is to help fund trails and trail-related recreational needs at the State level. Funding for the RTP comes from federal gas taxes paid on non-highway fuel used in off-highway vehicles, and the program is administered at the Federal level by the Federal Highway Administration.

At the State level, the Secretary of the DENR has assigned that responsibility to the Division of Parks and Recreation and its State Trails Program. The North Carolina Trails Committee is a seven-member advisory committee who will review all applications and make recommendations for funding. The Secretary of DENR has the final approval authority for North Carolina.

### State Transportation Improvement Program

In North Carolina, all bicycle and pedestrian projects are prioritized and scheduled into the State Transportation Improvement Program. These projects may be funded through Federal-Aid funds or State funds.

Independent bicycle and pedestrian projects across North Carolina are included in NCDOT's State Transportation Improvement Program (STIP) outlining transportation priorities for the next ten years. The STIP indicates when each phase of a project is slated to begin and the cost of each project phase. Improvements for bicycling and walking may also be included in the STIP as part of the construction of a highway project.

The STIP are determined through the strategic prioritization process. Projects are prioritized and ranked through a methodology created by Division staff. The STIP are included in the 5-year Work Program and the 10-year Program & Resource Plan.

Through NCDOT, there are a variety of funding programs comprised of Federal-Aid and/or State dollars. There are also other funding opportunities for projects and programs related to bicycle and pedestrian transportation which are not administered by NCDOT. Other state agencies and local governments may be a more appropriate resource, depending on the project. In addition, some communities look toward non-profit organizations, foundations, businesses, or other creative public/private partnerships to provide capital or resources as a way to move a project, program or activity from a concept into reality.

Much of the funding that passes through NCDOT is derived from the varying categories of Federal Aid Construction Funds, including National Highway System (NHS), Surface Transportation Program, or Congestion Mitigation and Air Quality funds. However, the state does provide some State Construction Funds for the construction of sidewalks and bicycle accommodations that are part of roadway improvement projects.

### Land and Water Conservation Fund

The Land and Water Conservation Fund (LWCF) provides grants for planning and acquiring outdoor recreation areas and facilities, including trails. Funds can be used for right-of-way acquisition and construction. The program is administered by the Department of Environment and Natural Resources as a grant program for states and local governments. Maximum annual grant awards are $250,000. The local match may be provided with in-kind services or cash.

More information: http://www.ncparks.gov/About/grants/lwcfmain.php

**Rivers, Trails, and Conservation Assistance Program**

The Rivers, Trails, and Conservation Assistance Program (RTCA) is a National Parks Service (NPS) program providing technical assistance via direct NPS staff involvement to establish and restore greenways, rivers, trails, watersheds and open space. The RTCA program provides only for planning assistance-there are no implementation funds available. Projects are prioritized for assistance based on criteria including conserving significant community resources, fostering cooperation between agencies, serving a large number of users, encouraging public involvement in planning and implementation, and focusing on lasting accomplishments.

More information: http://www.nps.gov/ncrc/programs/rtca

**Bicycle and Pedestrian Planning Grant Initiative**

The Bicycle and Pedestrian Planning Grant Initiative is a matching grant program administered through NCDOT that encourages municipalities to develop comprehensive bicycle plans and pedestrian plans. The Division of Bicycle and Pedestrian Transportation (DPBT) and the Transportation Planning Branch (TPB) sponsor this grant. All North Carolina municipalities are eligible and are encouraged to apply. Funding allocations are determined on a sliding scale based on population. Municipalities who currently have bicycle plans or pedestrian plans, either through this grant program or otherwise, may also apply to update their plan provided it is at least five years old.

More information: http://www.ncdot.gov/bikeped/planning/

**North Carolina Department of Environment and Natural Resources**

The North Carolina Department of Environment and Natural Resources Division of Coastal Management offers the Public Beach and Coastal Waterfront Access Funds program, awarding $500,000 to $1 million a year in matching grants to local governments for projects to improve pedestrian access to the state's beaches and waterways. Eligible applicants include the 20 coastal counties and municipalities therein that have public trust waters within their jurisdictions.

More information:
http://www.nccoasta lmanagement.net/Access/about.htm l

**The North Carolina Division of Parks and Recreation**

The North Carolina Division of Parks and Recreation and the State Trails Program offer funds to help citizens, organizations and agencies plan, develop and manage all types oftrails ranging from greenways and trails for hiking, biking and horseback riding to river trails and off-highway vehicle trails.

More information: http://www.ncparks.gov/ About/grants/main.php

**The North Carolina Parks and Recreation Trust Fund (PARTF}**

The Parks and Recreation Trust Fund (PARTF) provides dollar-for-dollar matching grants to counties, incorporated municipalities and public authorities, as defined by G.S. 159-7. Through this program, several million dollars each year are available to local governments to fund the acquisition, development and renovation of recreational areas. A local government can request a maximum of *$500,000* with each application. An applicant must match the grant dollar-for-dollar, 50% of the total cost of the project, and may contribute more than 50%. The appraised value of land to be donated to the applicant can be used as part of the match. The value of in--kind services, such as volunteer work, cannot be used as part of the match.

More information: http://www.ncparks.gov/About/grants/partf main.php

## Next Steps

This Vision Plan should be used as a guide for the town that contains the wants, needs, and desires of residents. Details that relate to specific ordinance revisions should be finalized through dialogue with residents, stakeholders, and town leadership.

This plan was created to understand the desires of the community. These desires are now included as part of the plan and have been formally recognized through the Visual Preference Survey, public input meetings, and feedback received from the presentation of design concepts.

Town leaders and governing boards should work together to ensure that the visions and aspirations developed because of this plan are realized in the years to come.

# Appendix 1: Capital Improvement Guidelines

## Introduction

The following guidelines are provided to serve as a basis for facility design in Ayden. Alterations may be necessary for specific projects. Consultation with a professional engineer or licensed landscape architect should take place when designing and installing any of the listed facilities. Coordination with the NC Department of Transportation may be required in instances where innovative practices are utilized.

The following resources were used in the creation of these guidelines:

- NC Complete Streets
- Model Design Manual for Living Streets
  www.Modelstreetdesignmanual.com
- Pedestrian and Bicycle Information Center, 2010
  www.walkinginfo.org/engineering/
  www.bicyclinginfo.org/engineering/
- Bicycle Parking Design Guidelines
  www.bicyclinginfo.org/engineering/parking.cfm
- Manual on Uniform Traffic Control Devices (MUTCD) U. S. Department of Transportation, Washington, DC, 2009
  http://mutcd.fhwa.dot.gov
- Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities: An ITE Proposed Recommended Practice.

## Pedestrian Facilities

**ESSENTIAL PRINCIPLES OF PEDESTRIAN CROSSINGS**

The following principles should be incorporated into every pedestrian crossing improvement:

- The safety of all street users, particularly more vulnerable groups, such as children, the elderly, and those with disabilities, and more vulnerable modes, such as walking and bicycling, must be considered when designing streets.
- Pedestrian crossings must meet accessibility standards and guidelines.
- Real and perceived safety must be considered when designing crosswalks—crossing must be "comfortable." A "safe" crossing that no one uses serves no purpose.
- Crossing treatments that have the highest crash reduction factors (CRFs) should be used when designing crossings.
- Safety should not be compromised to accommodate traffic flow.
- Good crossings begin with appropriate speed. In general, urban arterials should be designed to a maximum of 30 mph or 35 mph (note: 30 mph is the optimal speed for moving motor vehicle traffic efficiently).
- Every crossing is different and should be selected and designed to fit its unique environment.
- Ideally, uncontrolled crossing distances should be no more than 21 feet, which allows for one 11-foot lane and one 10-foot lane. Ideally, streets wider than 40 feet should be divided (effectively creating two streets) by installing a median or two crossing islands.

## Crosswalk Markings

According to the MUTCD, the minimum crosswalk marking shall consist of solid white lines. They shall not be less than 6 inches or greater than 24 inches in width.

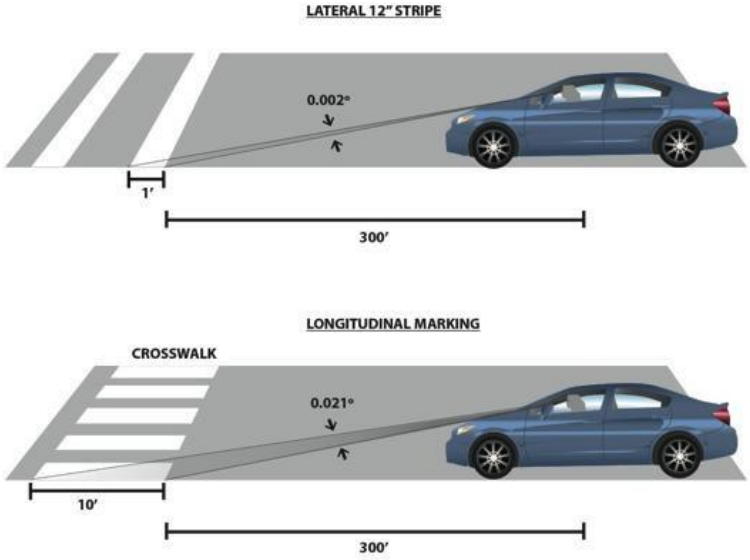
**Placement**

The best locations to install marked crosswalks are

- All signalized intersections
- Trail crossings
- High land use generators
- School walking routes
- When there is a preferred crossing location due to sight distance
- Where needed to enable comfortable crossings of multi-lane streets between controlled crossings spaced at convenient distances

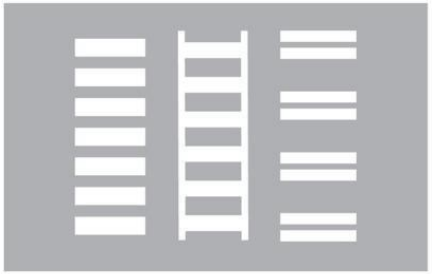
## High-Visibility Crosswalks

Because of the low approach angle at which pavement markings are viewed by drivers, the use of longitudinal stripes in addition to or in place of transverse markings can significantly increase the visibility of a crosswalk to oncoming traffic. While research has not shown a direct link between increased crosswalk visibility and increased pedestrian safety, high-visibility crosswalks have been shown to increase motorist yielding and channelization of pedestrians, leading the Federal Highway Administration to conclude that high-visibility pedestrian crosswalks have a positive effect on pedestrian and driver behavior. Colored and stamped crosswalks should only be used at controlled locations.




Longitudinal crosswalk markings are more visible than lateral crosswalk markings (Credit: Michele Weisbart)

Staggered longitudinal markings reduce maintenance since they avoid vehicle wheel paths.



Typical crosswalk markings: Continental, Ladder, Staggered Continental (Credit: Michele Weisbart)

Continental striping (far left) provides the highest visibility.

## Crosswalks and Accessibility

Longitudinal crosswalk markings provide the best visibility for pedestrians with limited vision.

Decorative crosswalk treatments, as shown here in Ayden, NC made of distinctive materials can become uneven over time.

Decorative crosswalk pavement materials should be chosen with care to ensure that smooth surface conditions and high contrast with surrounding pavement are provided. Textured materials within the crosswalk are not recommended. Without reflective materials, these treatments are not visible to drivers at night.

Decorative pavement materials often deteriorate over time and become a maintenance problem while creating uneven pavement.
The use of color or material to delineate the crosswalks as a replacement of retro-reflective pavement marking should not be used, except in slow speed districts where intersecting streets are designed for speeds of 20 mph or less.

## Raised/Landscaped Medians

Raised islands and medians are the most important, safest, and most adaptable engineering tool for improving street crossings. *Note* on terminology: a median is a continuous raised area separating opposite flows of traffic. A crossing island is shorter and located just where a pedestrian crossing is needed. Raised medians and crossing islands are commonly used between intersections when blocks are long (500 feet or more in downtowns) and in the following situations:

Staggered median crossing
(Credit: Marcel Schmaedick)

- Speeds are higher than desired
- Streets are wide
- Traffic volumes are high
- Sight distances are poor

Raised islands have nearly universal applications and should be placed where there is a need for people to cross the street. They are also used to slow traffic.

### Reasons for Effectiveness

Their use changes a complex task, crossing a wide street with traffic coming from two opposing directions all at once, into two simpler and smaller tasks. With their use, conflicts occur in only one direction at a time, and exposure time can be reduced from more than 20 seconds to just a few seconds.